Healing Gardens: Humanizing the Design of Modern Hospitals

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ABSTRACT

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In concert with scientific developments regarding the efficacy of nature as a tool for healing, there has been a shift in how architects are approaching the design of urban hospitals to implement nature into their circuitry. This paper will be divided into three parts and each will contribute towards the main question of the thesis: How has architecture and nature been used in the past and present in health care and are their effects on the patient's experience significant?

The first part will look at the architectural theory, Functionalism, and its role in the humanizing of architecture Secondly, literature that focuses on the restorative effects of gardens and nature on the body and mind will be examined. In the final part, I plan to explore the theoretical framework behind humans' inclination and responsiveness to nature, patient responsiveness and outcomes from interactions with green space, and lastly, the design features for green spaces which are most conducive for healing. The conclusions reached are that exposure to nature and gardens are highly beneficial to an individual's health outcomes. The inclusion of healing gardens is a reflection of human-oriented design, a quality of modern functionalism. Architects should place the human at the center of their design objectives and tailor their blueprints to accommodate the individual.

Table of Contents

Introduction

As hospitals have evolved, they have transformed from having rudimentary medical services to facilities that contain restaurants, coffee shops, and areas of green space and natural relief. The environment and architecture of a medical facility has a profound impact on patient healing and satisfaction. The fenestration, or the arrangement of windows, can purposefully omit or allow light into a room at certain times of the day, or a room can lack partitions and have tall, sound absorbent ceilings and walls to encourage talk and interaction. The pale, soothing palette of colors, such as blues and yellows coat the walls of hallways and rooms to create a calm, serene aura in the space. Often, buildings are integrated into their surrounding environment and act as an inorganic extension of the natural world. Our humanistic inclinations to be in nature mold the design of buildings.

Architects of medical facilities are incorporating green spaces for the therapeutic benefit they bring to patients. This exposure to nature can take various forms from a simple plant hung in the corner of a patient's recovery room to an array of windows that overlook a scenic landscape outside. Because of geographical and logistical limitations, hospitals often are found in the heart of a metropolitan city where there is little remaining evidence of ecological and natural forms. In concert with scientific developments regarding the efficacy of nature as a tool for healing, there has been a shift in how architects are approaching the design of urban hospitals to implement nature into their circuitry. The result is green spaces formally referred to "healing gardens." These gardens are often a room, or even a series of rooms or levels, that function to provide a space for a hospital's patients, staff, and visitors to retreat towards to alleviate stress and aid in the psychological and physiological recovery of a hospital visit. These gardens take many forms and are often designed to aid a specific demographic of people. For example, the

more modern hospitals have gardens for the use of staff, and another garden for visitors, patients, and children. With that, their designs and elements vary, but plants, water, flowers, and vegetation are common elements among all of them. The benefits of using green space in the medical environment are significant and have been confirmed through many studies conducted in children's hospitals, cardiac rehabilitation centers, prisons, and mental hospitals. These benefits range from accelerating a patient's recovery from surgery to aiding staff recover from mental fatigue. Before diving into these discussions head first, it is important to lay the framework for these spaces by investigating the history, philosophy, and movements associated with gardens, architecture, and with man's interaction and experiences with nature.

This paper will be divided into three parts and each will contribute towards the main question of the thesis: How has architecture and nature been used in the past and present in health care and are their effects on the patient's experience significant? The first part will look at the architectural theory, Functionalism, and its role in the humanization of architecture will be examined. This chapter will present a historical and ideological outline of Functionalism and its evolution across multiple generations of architects and era. The centerpiece of this section on Functionalism is a case study on Alvar Aalto, a highly influential architect and a pioneer of modern design. This case study will look at Aalto's buildings, furniture, and philosophy about architecture, modernization, and humanity and apply the findings to modern hospital design. The second section examines literature that focuses on the restorative effects of gardens and nature on the body and mind. For this section I will be looking at texts from authors during the Transcendentalism Movement as well as philosophy about gardens and interpret the insights the writers have towards health, the body, and nature. The third chapter presents modern day examples of hospitals across the world that incorporate healing gardens into their design. Patient

responsiveness and outcomes from interactions with healing gardens and the design features for healing gardens which are most conducive for healing will be discussed. This section will be largely derived from secondary texts, or more specifically, studies that provide a quantifiable measure of how people react to exposures to nature and certain architectural elements. The final section will be comprised of new observations and analysis I make through field work I conduct myself. I visited Dell Children's Medical Center of Central Texas applied my knowledge of this topic to observe and analyze people's interactions with the healing garden.

Through this research, I find that healing gardens are beneficial to a hospital occupant's spiritual, psychological, and physiological health. Exposure to nature and gardens is highly beneficial to an individual's health outcomes. The inclusion of healing gardens in hospitals is a reflection of human-oriented design, the defining quality of modern functionalism and Alvar Aalto's philosophy. The function of a hospital is to improve the health of patients through medical care and the hospital's design should be tethered to that primary function. A hospital's architecture should be functional from the human point of view. In the words of Alvar Aalto, the design process of a hospital should be a great synthetic process of combining thousands of human functions, the creation and combination of different technical things in such a way that they will provide for the human being the most harmonious life. Architects should place the human at the center of their design objectives and tailor their blueprints to accommodate the individual.

Functionalism in Architecture and Hospital Design

There is a duality to design in architecture. A building can be viewed as a harmonious system of both function and expression. Function is viewing each part of a building as directly associated with a practical role. Not only are the technics of a building under consideration, such as the heating and cooling systems in a building, the draining and plumbing systems, or the degree of stress and load that can be placed on the foundational level, but also the role each part plays in the emotional and psychological response of whoever interacts with the building. Expression stems from these constructional and functional forms and is utilized as a means of "conveying the meaning of the building to the spectator and user, and enable him, with a fuller response on his side, to participate in its functions (Lewis 112)." These "fuller responses" could be a feeling to act more studious when one walks across the grounds of a university, or to behave more piously as one enters a chapel or religious space. While the functionality behind a library or church might have many similarities on the engineering side of the respective buildings, how these parts are assembled and displayed changes the meaning and symbolism attached to these spaces. Lewis contends that it is of the "upmost importance that symbol and function in architecture should be brought into an effective harmony" (113). The symbiosis between symbolism and functionality is the ideology that frames the design for modern healthcare facilities. This synthesis of symbolism and functionality into a singular design methodology is the evolutionary product of multiple generations of architects.

Origins of Functionalism

Functionalism is a value, a blueprint to guide the design of a building. A functionalist places an emphasis on the importance of "fitness and utility" (Zurko 4). In other words, it stresses that a structure and all of its parts must serve a useful purpose, even seemingly insubstantial features such as embellishments and ornament. One might ask what useful purpose does ornamentation serve in the overall design of a building except for its purely aesthetic purposes? Louis Henry Sullivan, a leading American functionalist, claimed that ornamentation was architecturally important and necessary as long as it justified its own existence "by means of some tangible or practical function. It is not enough that it try merely to delight the eye. It must articulate the structure, symbolize or describe the function of a building or serve some useful purpose" (Zurko 5).

Aspects of functionalism have been present in all architecture dating back to even the most rudimentary hut: the basic hut had the function of providing protection from the sun and weather. However, the notion of function is complex and heavily loaded with different interpretations: types of functions range from "the practical needs of the occupants of a building, to the functional expression of structure; the psychological needs of the occupants; the social function of architecture; and the symbolic-monumental function of architecture" (Zurko 6). The most popularly accepted definition for Functionalism amongst architects and philosophers is a combination of the first two types listed: it encompasses the practical needs of the occupants of a building and the functional expression of the structure. This definition is mutable and is often some combination of these core values. For example, the highly influential architect Luis Henry Sullivan defined "function" to mean the "physical, emotional and spiritual as well as physical aspects of the use of the building" (Gold 228). Sullivan was responsible for the phrase "form

follows function," the mantra for 20th Century Early-Modernist architecture. In other words, if one knew the functions and purposes of a building, the form of it could then be expressed and materialized. However, many of the radical figures proposed a more comprehensive interpretation of this philosophy: Andrd Lurgat and Bruno Taut, for example, "frequently stressed the social function of architecture" and Le Corubsier made the statement that "the business of Architecture is to establish emotional relationships by means of raw materials" (Zurko 7). Neither interpretation is more correct than the other and when discussing the relationship between functionalism and health care facilities, it would be most charitable to synthesize these different interpretations. It would not be a completely accurate analysis to omit Lurgat's or Corbusier's view about the social and psychological value that a properly designed structure can contain. It is paramount that a healthcare facility not only provide the material needs for the occupancy by patients and staff, but also that it forms an emotional connection with those residing within it.

Early Modern Functionalism

Modern interpretations and arguments for functionalism often rely on analogy and can be grouped into two main categories: the mechanic analogy and the organic analogy.

The mechanic analogy can be condensed into the following statement: beauty, or a formal perfection, is the product of the greatest "mechanical efficiency, or that perfectly engineered creations achieve beauty creations achieve beauty without a conscious search for it" (Zurko). This statement can be interpreted as perfect displays of machinery, engineering, and mathematics serve as significant sources of inspiration for architects. The analogy contends that architects

should approach the design of buildings using the same mindset that an engineer would approach a manufacturing process, for example.

Le Corbusier was a proponent for this analogy and is known for his popular metaphor, "the house is a machine for living in' (Zurko 9). He placed an emphasis on approaching design using an "engineer's aesthetic" over an organic or ethical approach, subjects that the other functionalism analogies explore. Expanding on his mantra, Le Corbusier even went on to compare some of the greatest technological inventions, modern airplanes and cars, to the Parthenon at Athens. The mechanics behind flight involve an extremely complex assortment of physics principles, such as the four key forces that act on a plane (lift, thrust, drag, and weight) that are accommodated by the plane's physical parts like the engine, wings, flaps, and tail. Le Corbusier's underlines that mathematical precision and accommodation for function as the necessary vehicle for a building's design and construction. The mechanical analogy has been validated by architectural paragons like Le Corbusier, Henri Van De Velde, and Bruno Taut and has transformed the identity of design and architecture.

When viewed through a mechanical lens, the products of architecture are admired for their technical apparatus and appliance. Returning to the idea of beauty, it is the mechanical efficiency, or making the function of a building the "chief determinant of form," like the design of an airplane is finetuned with engineering precision to fly, that qualifies it as a timeless and beautiful structure.

The organic analogy, on the other hand, is in parallel to evolutionary thought, a metaphor that gained momentum through the natural and biological theories of "Lamarck, Erasmus Darwin, Charles Darwin, and other figures of the eighteenth and nineteenth centuries" (Zurko 10). The definition and characteristics of organic architecture are elusive and are heavily

dependent on who is being asked to define it. For example, Claude Bragdon, architect and close friend of Louis Sullivan and editor of Sullivan's *Kindergarten Charts*, one of the most influential works written about theories of architecture, art, and life, explained in a lecture at the Art Institute of Chicago in 1915 that "architecture throughout the world and down the ages has been bisected by an inevitable duality, having been both organic (and as such following the law of natural organisms) or arranged (i.e. according to some Euclidean ideal devised by man). Bragdon also goes on to state that the greatest architectural feats and masterpieces are a blend of both "organic and arranged:" there are multiple phases of creation, first being the "melting and fusing by creative heat"(organic -psychic) and the second, the "choosing, directing, and arranging (intellectual) that is another phase that it considered as equally important as the former phase. He states that art and architecture is only perfected when each of these two phases, the organic and intellectual, maximally "contributed their respective parts" (Zevi 67).

In *Kindergarten Chats* by Louis Sullivan, the architect aimed to arrive at the true meaning of "organic architecture" through a process of examining what "organic" does not mean (Zevi 68). In Sullivan's words, organic architecture is not "pitiful in its folly… functions without forms, forms without functions, details unrelated to the masses, and masses unrelated to anything but folly." Rather organic means to him "living," "development," "a searching for reality – a word [he] loves because [he] loves the sense of life it stands for, the ten-fingered grasp of things it implies" (Zevi 68).

Walter Curt Behrendt, a German-American architect, authority of city planning and housing, and a colleague of Louis Sullivan, made the following declaration "there is only one instance in history of the organic and formal (non-organic) uniting in the same work of art – the Doric temple. Everything else can be given a place in one or the other of two contrasting

categories and be classified, either as ‘formative art’ or as its opposite, ‘fine art’ (Zevi 69). The widely accepting definition for this analogy touts nature as the primary source of inspiration for architects and is based on the understanding that the “organic forms of nature, each part as well as the whole, conforms to its function” (Zurko 10). In the same vein, supporters of this theory believe that architecture should be organic as it therefore tethers it to its sole function as a building.

While these two analogies may appear to compartmentalize functionalism, certain interpretations for organic architecture can, if analyzed word by word, be applicable to the works that were characterized as “mechanic” or “moral” functionalism. This hinges on whether we are to tie the idea of function to a “theoretic, classic and predetermined plan or to the natural growth of things from their essential nucleus” (Zevi 71). An analogy to help resolve this question is as follows: in many European countries, when one decides to build a home, he or she thinks of a cube or another basic shape. Upon first constructing the house, he or she builds it much larger than actually needed at the time of its construction to account for additional rooms in the event that he or she has children. Therefore, one would need to build additional rooms within the already built space (Zevi 71). On the other hand, a laborer in America would build a house that is sized appropriately for that time and “builds one room then as time goes on, a second and a third to meet his progressively changing requirements” (Zevi 72). In the European’s instance, the growth of the house is limited by a definite framework and the initial shape of the house he built. This way of looking as matter is coined to be “theoretic, inorganic, and classic” (Zevi 72). The American’s approach is “more evolutional, closer to natural growth, and organic” in the sense that the “exterior forms are derivative of the interior space” (Zevi 72). So the difference between organic and inorganic architecture can be highlighted in the approach of planning.

A New Wave of Functionalism: Architecture Imbued with Human Values

Lewis Mumford argues that modern functionalism can be refined by making two major alterations to its conditions. The first is that function cannot be viewed in a strictly physical or mechanical sense, "as applying only to the physical functions of the building" but rather the whole personality of the building, such as psychological elements that affect the "health, comfort, and pleasure of the user" (Lewis 125). Second, expression itself, which becomes apparent through factoring in the building's whole personality, is "one of the primary functions of architecture" (Lewis 125). Therefore, a functionalist views a building as an object imbued with not only physical and mechanical necessities, but also with the cultural and personal needs of the people residing within it. In the Middle Ages, architects for cathedrals weighed calculations of acoustics and sound design against considerations for the humans that were too be occupying that space. Instead of maximizing acoustic clarity, economy and comfort, the architects instead sacrificed these qualities to evoke the presence of a higher being. Because these sacrifices were made, a cathedral magnified the mystery and power of god and minimized the individual attending the service (Lewis 125). The design of these cathedrals was a harmonious system of both symbolism and functionality. During the Renaissance period, a common aristocratic activity was to attend opera houses as a display of and indulgence in status and wealth. The opera houses were often shaped like a horseshoe. Acoustically, this design was severely lacking and did not provide a crisp, sonic experience to the audience. However the horseshoe shape provided an unobstructed view for people in each of the boxes. In this instance, the music was secondary to the parading of wealth by upper-class families in virtue of attending the opera house (Lewis 125). The culture and social currency of attending a show at the opera

house, and being seated in a box, was expressed through the architecture of the facility. Again, the functions of this building are in harmony with cultural and personal needs of that time period.

In modern functionalism, it is the human being that takes reign over the architecture, rather than the machine. Looking at the work by Frank Lloyd Wright, his structures were dually functional in itself and symbolic of human purposes (Lewis 128). Each of Wright's works "were informed by human ideals, and by a sense of what is due to the person whose varied needs and interests that must be reflected in the building" (Lewis 126). The idea of a structure being endowed with human ideals is a representation of humanism and a quality of the second generation of functionalism.

A second generation of architects, led by Alvar Aalto, who is considered the best of them, were born in the setting of functionalism and paved the road for a reimaging of what that style of architecture meant. The first generation of functionalism, as described in the previous sections of this paper, was fueled by a different palette of motives: in order to legitimize and establish a real movement, architects had no choice but to "develop rigid theories and to invent, if not a set of clichés, a restricted vocabulary and to insist on its use as a matter of discipline" (Zevi 56). This can be reflected in the rigid categorization and labeling of functionalism into sub-categories like mechanic, inorganic, organic, and moral. Theorists and architects like Sullivan and Behrendt viewed organic and inorganic architecture as mutually exclusive elements of a building, with Behrendt even claiming that there was only one building to date that expressed both the formal and informal: the Doric Temple (Zevi 69). The canons of early functionalism, beginning with Le Corbusier were tethered to absolutes with little fluidity or room for compromise. This first phase of modern functionalism and architecture was rationalized from a strictly technical standpoint: an emphasis was placed on the economic dimension of the buildings and the construction confined

by the mechanic theories that defined the architectural movement. The main criticism with the early movement is not that the heavily rationalization in itself was incorrect, but that the rationalization did not go deep enough (Schildt 102). Rather, because architecture is a discipline that is omnipresent in all aspects of human life, real functional architecture must be functional mainly from the human point of view" (Schildt 102). In other words, architecture needs to have a larger human value to it.

This second wave of architects used the foundation of early functionalism as a base to advance forward. When looking at this reactionary movement in retrospect, the overarching goal of figures like Aalto was to "discover a unity – a singleness of trend and purpose – in the dichotomy of functionalism and formalism which the first generation had left them to overcome" (Zevi 56). They approached architecture with the attempt to mold formal and informal, organic and inorganic, pure form and technique into one.

Alvar Aalto synthesized "vivid functionalism and high artistic inspiration" into a singular, rational approach towards design and construction. Aalto reimagined how functionalism was interpreted: it is not only operational, but highly emotional and humanistic as well. Some of Aalto's defining works include the Paimio Sanatorium in Finland (1931), the Library at Viipurii in Finland (1934), the MIT Baker House Dormitory in Massachusetts (1948), and lastly, his furniture. Arguably the most notable characteristic of Aalto's work is his consideration for the occupants or the users of the buildings he is designing. His work encapsulates the second movement of modern architecture, a phase with "the special aim of solving problems in the humanitarian and psychological fields" (Aalto and Schildt 103).

The methodology of Aalto's designs and this new movement as a whole resembles a natural and fluid symbiosis between science, art, and instinct, with an emphasis on the latter two

qualities. Aalto holds the view that architecture, although its methods can resemble scientific and technical ones, is more than solely an analytical, or a purely scientific field. Aalto states tt is rather a "great synthetic processes of combining thousands of human functions" and "the creation and combination of different technical things in such a way that they will provide for the human being the most harmonious life (Aalto and Schildt 102).

In a lecture at the Vienna Architects' Association in April 1955, Aalto states that the problems of architecture are "treated too superficially… things are seen as too much as a question of form. The most difficult problems are naturally not involved in the search for forms for contemporary life; it is a question of working our way to forms behind which real human values lie" (Aalto and Schildt 176). Aalto criticizes the excessive mechanization and machine of the time, citing the comedic masterpiece, Modern Times by Charlie Chaplin, a film that outlines the inescapable aspect of machinery and the ills of the then state-of-the-art factory work. From looking at these problems and conflicts under closer scrutiny, it is revealed that at in a highly mechanized age, the process of creating something is impossible without the destruction of something at the same time. Also, these actions "take us farther and farther away from nature as it really is" (Aalto and Schildt 177). More obvious examples of this would be the construction of highways, neighborhoods, and other modern-day infrastructure at the expense of nature being destroyed or altered from its original state. Similar cases regarding the deterioration of nature and natural elements in the name of materialism and technology are occurring in highly specialized areas. Aalto talks about the invention and evolution of the electric light and he poses the following question: while this new source of light is more convenient that oil lamps used by previous generations, is this new form of light better quality than what was used before? He concludes that it is not (Aalto and Schildt 177). His reasoning is that a sixty to eighty-watt bulb

placed at some distance from the reader is required to read a book whenever "two wax candles were enough for our grandparent's" (Aalto and Schildt 177). Aalto goes on to say that despite the invention of electric light, it is not enough and humans have gone on to create high-voltage neon light that is "not constant and has too blue a spectrum:" "we need even more light for the same activity, as the physical and psychological quality of light is not as good" (Aalto and Schildt 177). Another example given by Aalto in this speech is the uselessness of ventilation systems. Although these systems are designed to pump fresh air into a room, because of the use of sheet metal ducts and the high intensity of friction that occurs in these ducts, the most critical component of air, ozone, is destroyed. Through many lab experiments it was shown and proven that "the biologically active qualities of air disappear almost entirely as a result of its rapid mechanical introduction into office buildings" (Aalto and Schildt 177). These examples highlight the paradoxical nature of machinery: while machines and devices are invented to improve the quality of our lives, they are ignoring people's well-being removing them from these natural elements that already do so.

Aalto says that despite the inhuman and biological paradoxes found around us, it is the architect's job to establish the right standards (Aalto and Schildt 177). Towards the conclusion of Aalto's speech in Vienna, he makes sure to emphasize that although undertaking an architectural project is a highly humanizing process, "the old question regarding form and monumentality remains a reality that architects must still confront, as they always have had to" (Aalto and Schildt 179). He likens the idea of stripping form from architecture to taking away the heavens from religion; that all efforts to ignore form have been architecturally fruitless. It seems too idealistic, too removed from the realities of construction, to ignore theory and form and rather design a building entirely off human intuition and natural inclinations. Aalto admits this: he says

"we know that the poor little man is almost impossible to save" however it is "the main task of architecture to humanize the Machine Age. In doing this it, however it must always work with form" (Aalto and Schildt 179).

An architect being creatively confined by form or being required to work with form can partially be traced back to the industrialization and standardization of parts and materials. When Aalto was asked "why don't you work so much anymore with free form as you did in the New York pavilion?", he replied with "I do not have the right material for it" (Aalto and Schildt 180). Think of a brick, for example. It has a strong geometric form with sharp right angles and corners. A brick wall, Aalto states, will have a cubist quality to it until "a brick is invented that will make it possible to speak a language of free form. It is not possible to make free-form architecture while using standardized materials and parts. (Aalto and Schildt 180). Until the brick is reinvented, or another form of it is created and standardized, it will not be possible to have "round, negative, convex, concave, or square walls" (Aalto and Schildt 180). Aalto claims that making standardization more flexible, allowing for one standard part to be utilized for a variety of ends, for a universal piece to be used in the creation of many forms, can help bridge the gap between free-form and form, between individualism and collectivism (Aalto and Schildt 180). However, how to achieve that very solution of reconciling planning and spontaneity with industrialization, standardization and machinery is difficult and remains a topic of concern to mainly thinkers and critics.

In a "Culture and Technology" article found in a 1947 Finnish magazine, Aalto talks about the impacts of technocracy on American society and how one should grapple with the encroachment of the industrial culture on architecture and our personal lives. He begins by saying "the freedom required by human nature has come into conflict with industrial mass

production in America" (Aalto and Schildt 137). Aalto states that it is because of mass-production that individualism and artistry has diminished. The invention of standardization has allowed for businesses to meet increasing demand; it is the economically viable option that ultimately drives down labor and production costs per unit. However, as Aalto writes, there is less customization and personal taste involved in the production process. And one must pay much higher prices for a good that has individual touches added to it. Social activists labeled this as a "tyranny exercised by mass-production over the small man" (Aalto and Schildt 137). While these observations might sound like a vague, over-exaggerated critique on the industrial age as a whole, it has extreme importance and relevance to the design of the buildings that are inseparable from our every-day lives, such as hospitals and health care facilities that will be discussed later in this paper. A Princeton round table around the time the "Culture and Technology" article was written focused on themes such as "how to overcome the tyranny exercised by industry over 'the small man' with losing its blessings" and "planning methods for man's physical environment" (Aalto and Schildt 137). The latter discussion highlights one of the main concerns when it comes to standardization and architectural design: "to what lengths should general planning be allowed to go if it does violence to the individual human being, and how much should be left to chance" (Aalto and Schildt 137). This recognition from the world's leading intellectuals like figures from Princeton, or writers at the New Yorker who, along with Charlie Chaplin, heavily satirized mass-production, only supports and validates Aalto's claims.

Aalto's philosophies outlined above are incorporated into the designs of his buildings and furniture. The synthetic approach towards design and planning is exemplified in the planning phase of the Paimio Sanatorium building in Finland. A combination of technical, physical, and

psychological measures and methods were used to determine how the hospital was to be designed.

Alvar Aalto's Paimio Sanatorium

Over the course of history, natural forms and elements have served as vehicles for the architecture of medical buildings. The paramount structure that established the contemporary standard for hospital design is the Paimio Sanatorium in southwest Finland by renowned architect Alvar Aalto (See Appendix B). The building, an isolated treatment center for tuberculosis, was an exemplarily display of humanizing architecture, harmonizing the biological knolls and dells of a person with the shapes and forms of the structure itself. Alto emphasized the "environmental qualities - topographical, plants, climate, light - of the natural surroundings in which it stands" (Quecedo 10). The organic evolution of the hospital's design, which began as a "T-shaped" floor plan and mutated and grew into its complex final form, is encapsulated by the following statement from Alto: " "I would like to add as my personal, emotional view that architecture and its details are in some way all part of biology. Perhaps they are, for instance, like some big salmon or trout. They are not born fully-grown; they are not even born in the sea or water where they normally live" (Quecedo 9). This manifesto is reflected in each nook, partition, and crevice of the building. Humanism and functionalism were the driving ideologies behind the conception of the Paimio Sanatorium, treating the building as a reaction to the personal needs of the patients living there.

At the time of the sanatorium's construction, tuberculosis was an epidemic in Finland, claiming the lives of nearly 100 people a week treated by exposure to fresh air and sunlight over

the course of weeks to months (Ray 83). To fully realize and understand the patient's experience while living in a hospital, Aalto actually performed a personal experiment after he was commissioned to design Paimio. Ill at the time, he perceptively took notes on the small details of the hospital he inhabited. The first thing we noticed was how frustrating and tolling it was on himself to have to lie down in a horizontal position all the time and that the rooms were "oriented for people in a vertical position, not for those who had to lie in bed all the time (Schildt 178). He noticed that while lying on his back, his eyes were confronted by harsh electric lights and felt strong current of the air conditioner against his head. Aalto describes these rooms as having "no inner balance, no real peace in the room that could have been designed specially for a sick, bedridden person (Schildt 178). Each of these nuisances and details were accounted for. The fact that Aalto used his personal experiences as a way of understanding design underlines his value of the human experience within design.

In addition to bringing forth his experiences as an ill patient, Aalto used experimentation on people, especially those who were sensitive and vulnerable, to gauge their reactions to various types of "forms and construction" (Schildt 178). The types of experiments carried out can be categorized into two categories: "1) the relation between the single human being and his living room; 2) the protection of the single human being against large groups of people and the pressure from collectivity" (Schildt 103). The experiments covered the questions of heating systems, lighting, colors, and room form. Because of the severity of the tuberculosis, most patients spent a majority of their time laying backwards in a reclining seat. Alto masterfully designed the patient living quarters to account for the angle at which the patients rested, organizing the room based of a "low slung, horizontal" axis rather than along a vertical axis that would be used for people standing erect (Anderson, Fenske, and Fixler). This allowed for patients to experience "full

morning sunlight, while lamps utilizing indirect light came from behind the patients head to minimize glare" (Anderson). All other qualities of the room were designed with the patient's horizontal orientation in mind. Each room offered windows, positioned to offer entirely unobstructed views of the surrounding environment from the patients reclined bed. Similarly, indoors, the building's orientation allowed for patients to only experience the "morning's softer rays", shielding their eyes from the harsher afternoon glare (Anderson, Fenske, and Fixler). Artificial light did not come directly from the ceiling, but rather the center of light is located outside the angle of the patient's vision (Schildt 103). This means that the ceiling is supposed to be darker, and a complimentary color should accent the darker shades. Aalto found that the air conditioners were a disturbance to the patients because of the air currents that would land directly on their face. To navigate this problem, Aalto devised an experimental heating system in which fresh air was carefully heated between the glazing of the double window panes. Also, ceiling radiators instead emitted warm air to the patient's feet rather than to their head. A hospital room has two patients per room and two sinks. The porcelain sinks were molded in such a fashion that the flow of the water from the faucet would hit the sink at a calculated angle, eliminated the noise and splash.

The building offers widespread accessibility, both visually and physically, to the outdoors. On the macro level, the corridors that housed the patients are oriented so that each balcony was south facing, and therefore one experienced light at an indirect angle to prevent from harsh, direct sunlight while outside (Anderson). The floor plan of the patient rooms allowed for people to easily move from their bed to their desk, which was placed in front of "large, plate glass windows" displaying the large forest outside, and each window itself was "threaded with heating elements to warm the glass" (Anderson, Fenske, and Fixler). Outside the hospital, a

winding collection of walkways with water features ran alongside the densely forested landscapes that enclosed the hospital grounds, encouraging the patients to take walks outside. The top deck of the building is accessible to the whole population at the hospital and it offers a space to relax and observe the views. Niche additions are made to all of these spaces to enhance the sensory interactions with the outdoors. For example, on the top deck, there are "small planters containing special pine varieties to modify the air quality (Ray 83). Nearly every aspect of the building allowed for the patients to interact with the natural world to not only combat tuberculosis but also help with the maintenance of mental health.

All of Aalto's work can be praised for this sensitiveness the even the tiniest of problems, for his precise attention to details. Aalto's designs are held as the result of "the complete reconciliation of a relentless functionalist's conscious with a fresh and personal sensibility … an endeavor to get closer to life and to the problems of the actual man – to study his psychology and his well-being" (Zevi 60). Even the design of his furniture has a thoughtfulness to it. For example, when designing a door handle, Aalto would pick up a lump of wax, compress it in his palm, and then take that impression and shape to be made into metal. His ply-wood chairs and Birchwood armchairs follow the contours of the human body in a variety of positions like eating, resting, and dressing (Zevi 60). The main takeaway from looking at Paimio is that incredibly small details, such as the removal of air conditioner currents or the angel at which the water falls on the sink, play a leading role in alleviating people's suffering. The idea that the details play a significant role in the patient's experience requires one the scale down the thought process to a micro level to affectively capture all the needs of the occupants. While this approach may be more costly, as it requires a greater attention to detail and increased labor time, it makes for the best experience of the patient. By designing a hospital that aims to maximally reduce patient

suffering, as Aalto did in Finland, patient and visitor satisfaction would increase and the it could eliminate the need to renovate or reconstruct the building in the future.

The Paimio Sanatorium embodies the values of modern functionalism and can be considered a paragon for how a hospital should designed. It challenges mass-production and standardization, forces that many have claimed remove us from our most natural and human inclinations, by tailoring every element of its design to the occupants of the building. What sets the hospital apart is the customization and individualization of the hospital on the micro and macro level. The hospital tackles the very concern of the industrial age: to what lengths should general planning be allowed to go if it does violence to the individual human being, and how much should be left to chance. Aalto leaves nothing to chance. He avoids general planning and instead designs the building layout, the rooms, the appliances, and the furniture in accordance to the psychological and physiological needs of the patients. The form of the hospital embodies purely human values. This was achieved through a combination of technical, intuitive, and artistic methods, each with the goal of providing for the human patient the most harmonious and accommodating experience.

Returning to the dialogue on organic architecture, the sanatorium draws its inspiration from nature. From the high-level design of the building as a whole down to the design of the patient's room and furniture, nature plays an inseparable role in how everything is materialized. The hospital's form is built around topographical elements, plants, climate, and light – the nature that surrounds the building. It is also built around the "nature" of human beings. The design is from the human's point of view. It fully integrates the mental and physical needs of a patient into its form. The masterful harmonization of the Paimio Sanatorium with natural elements reveals how two ideological approaches, functionalism and humanism, might be the best philosophical

and ethical stances to frame the design of a healthcare facility. The hospital was constructed before scientific research materialized and quantified the benefits of exposure to nature and sunlight, or other complex forms of analytics objectified the art form of architecture. Alvar Aalto intuitively used design features that are now scientifically credited for being conducive for patient healing and well-being. Why injecting functionalist and humanist values into the architecture of healthcare facilities has yielded the most useful and revered buildings is because of what the values signify and their perfect harmony with the purpose of a hospital: to provide physical and mental medical care to people in need. Humanism is a philosophy that places humanity at the centerpiece of existence, elevating mankind's needs above all else. Every element of the Paimio Sanatorium serves a practical purpose and use, from the oriented balconies, to the pine varieties found on the top deck, to the splash-less sinks and toilets in the patient rooms. When both ideals operate in unison, they guide the design of healthcare building to be one that does not exist as an independent, monolithic structure but rather of one that is intimately intertwined with and responsive to the inhabitant's "physiognomic, phenomenological, and cognitive phenomenas" (Anderson, Fenske, and Fixler).

Now that we have seen how important these ideologies and theories of design are for architecture and the human experience, how can they be applied in today's world? Paimio was constructed in an idyllic setting, placed in the heart of dense forestry and far removed from civilization. Given its surroundings the hospital could be easily integrated and blended with trees, plants, and shrubs. However, we must confront the geographic reality that almost all hospitals are burrowed deeply within metropolitan areas where there is a low presence of greenery and natural elements. How can one create organic and nature-driven architecture when the building itself must exist in a very artificial and industrial setting? Architects have

compromised with this issue is by transforming hospital rooms, patios, and terraces into living gardens that are surfaced with many different types of flowers, plants and vegetation, or spaces known as "healing gardens." The goal of a healing garden is to provide a space for hospital's patients, staff, and visitors to retreat towards to alleviate stress and aid in the psychological and physiological recovery of a hospital visit. The healing garden epitomizes the architectural values established during the second generation of functionalism: it humanizes a hospital by providing a nature-oriented space that engages with the psychological and emotional factors of its occupants. Gardens are highly spiritual and symbolic spaces that represent a duality of nature and art that solidify both individual and collective identities. Their inclusion with the hospital is motivated by their function, in relation to the whole building, of alleviating stress and nurturing personal and communal values.

Locating Meaning in Gardens

A fundamental question is imbedded in understanding why human beings locate meaning and significance in gardens. Why do humans manipulate and form a dominion of nature in their own worlds? Many philosophical interpretations cite the creations of a garden as a result of the "marveling at nature's beauty, registering hints of transcendence and the evocation of a 'special state of mind'" (Gardos 354). Others say a garden's formation is mediated through our evolutionary instinct to recreate forms and spaces that are reminiscent of landscapes that were of significant value to "our primitive ancestors:" a garden representing an area that is a marriage of shelter and sustenance with ideas of "prospect" and "refuge" (Gardos 354).

Firstly, it is important to establish a definition for a garden to serve a as map for navigating these philosophical interpretations that explain this space. The Merriam Webster Dictionary attributes two definitions to the word "garden", each with three qualifying attributes. The first states that it is a: a plot of ground where herbs, fruits, flowers, or vegetables are cultivated, b: a rich well-cultivated region, and c: a container (such as a window box) planted with usually a variety of small plants. This definition serves a purpose, but it fails to capture the implicit knowledge of what a garden is. Mara Miller proposes a refined definition: "A garden is any purposeful arrangement of natural objects… with exposure to the sky or open air, in which the form is not fully accounted for by purely practical considerations such as convenience (Miller 15). This interpretation brings us closer to what a garden is, but it is still cut and dry: it maintains that the garden is a physical entity and does not take into consideration their metaphysical, or "virtual" element (Cooper 17). This addendum ultimately serves to distinguish between a purely natural place and one that is architected by human beings, the latter prompting a different type of engagement when interacted with. Rather, to "describe, experience and engage with a place as a garden is to do so in ways quite different from those appropriate to a merely natural place" (Cooper 17).

Gardens as Forms of Nature

While many of the elements, functions, and features of a garden are "natural," one's experience and appreciation of gardens does not mirror the appreciation one would form of nature because gardens are inherently human artifacts (Cooper 41). When natural elements, like plants, shrubs, and trees are placed in a garden, their identity is formed through the experience of them in relation to the whole, rather than formed by an independent, "purely physical

description." (Cooper 57). In other words, a tree experienced in the collective atmosphere of a garden is greatly contrasted by a tree experienced in a forest. Virginia Woolf, in her short story "A Summing Up", integrates this theory of holism by describing the experiences of a tree in a garden and the same tree in a marsh. During a meditative state in a garden, the narrator describes a branch of a tree "becoming soaked and steeped in her admiration for the people of the house; dripped gold, or stood sentinel erect. It was part of the gallant and carousing company." Upon a revelation about the soul, the tree is then transformed in a field tree – the only one the marsh that is denuded of its gild and majesty (Woolf 140). While the tree is physically and descriptively the same, the context in which they are found arms the object with a unique meaning. The English philosopher Roger Scruton contributes to this idea by stating that "trees standing in a garden join both the Earth and the Sky; they serve to gather other things in the garden around them, and are essentially participants in the network of between-ness which is what we see all around us in the garden" (Scruton 83). These excerpts from Cooper, Woolf, and Scruton can be used as ammunition for arguing that an experience in a garden isn't solely an engagement with nature in its purist form, but rather a dual-experience of both human art and nature. This postulation frames the proceeding section which will discuss the significance of gardens in both the communal and individual experience.

The Individual's Experience in the Garden

The idea that the physical engagement with gardens evokes a cerebral experience of "contemplation, imagination, meditation, and memory" has been the thematic focus of numerous bodies of work that span across both temporal and geographic boundaries (Cooper 83). Traveling back to the eleventh century, the Chinese author Sima Guang wrote on silk "The Garden for

Solitary Enjoyment" which described the garden as a space that is "under (his) own control, alone and uninhabited." This work by Guang is still referenced today by landscape enthusiasts for its impact on the naming and distinctions formed regarding different parts of a garden. A more recent example that highlights the refuge that gardens offer is found in R.S. Thomas's poem "The Garden":

It is a gesture against the wild,
The ungovernable sea of grass;
A place to remember love in,
To be lonely for a while;
To forget the voices of children
Calling from a locked room;
To substitute for the care
Of one querulous human
Hundreds of dumb needs.

It is the old kingdom of man.
Answering to their names,
Out of the soil the buds come,
The silent detonations
Of power wielded without sin.

This poem brings the themes of restoration, isolation, and welfare and their intersection with gardens to the foreground. The line "To substitute for the care of one querulous human hundreds of dumb needs" signifies that gardens are a sanctuary for the human spirit, and engagement with their atmosphere dampens the busyness of the mind that comes naturally packing with living. Returning to Woolf's short story "A Summing Parts", it is important to note that the meditation and epiphany realized by the narrator occurs while she is sitting in the garden at her home. These occurrences of gardens as therapeutic and restorative tools throughout various time periods and regions of the world speaks for the intrinsic value that they contain. While the architectural intent behind the creation of these gardens varies across different cultures and evolves over time, the

impact it has on a visitor engaging with these spaces appears to be constant, signifying a universal quality about their psychological benefits.

Tightening our focus towards the modern urban world, gardens are currently being incorporated into densely compacted cities, such as New York City, where vegetation and green space is almost nonexistent with the purpose of providing "refuge from men" (Adams 319). New York City has often been used as the subject when matters of overcrowding, urbanism, and ecological decay are discussed. It is a city of dichotomy. One can experience a profound sense of interconnectedness, being at the epicenter of human civilization, or a grand sense of isolation under the weight of the endless concrete and metal structures that occupy every square foot of land, or the thousands of anonymous faces that glide past you on a given day. Gatson Barchelard offers the perspective that in places where "houses are no longer set in natural surroundings, so that everything is "artificial", social life itself becomes artificial or mechanical and intimate living flees" (27). This sentiment, towards New York City specifically, is eloquently expressed by postmodern author Italo Calvino in letters he wrote to a friend after receiving a grant to travel to the United States:

> "New York has swallowed me up like a carnivorous plant swallowing a fly, I have been living a breathless life for fifty days now, here life consists of a series of appointments made a week or a fortnight in advance… it is the land of the richness of life, of the fullness of every hour in the day, the country which gives you the sense of carrying out a huge amount of activity, even though in fact you achieve very little, the country where solitude is impossible"

It is these feelings expressed by Calvino, alongside the deterioration of environmental and social identities, all of which are elements of large metropolitan cities, that urban planners are attempting to combat through the implementation of community gardens.

The initiatives for community gardens is partially fueled by radical ideologies that view these gardens as something greater than an area to grow carrots and decorate lots with colorful flowers. Rather, many writers, gardeners, and artists view them as "central components in a critique of civilization and in the development of alternative visions of society" (Hassel 12). These activists view gardening as a way creating dominion over the dominating effects that global capital has on "vitality, creativity, and imagination" (Hassel 12). These views echo arguments that define gardening as man's attempt at creating agency over plants and nature which, outside of the context of the garden, are wild, untamable, and without meaning. It is interesting to note the parallels between these ideologies. Both of these interpretations contend that gardens are used as instruments for gaining control over forces that are uncontrollable. The community gardens in New York City (see Exhibit E) are attempts at exerting control over urbanization and are not an attempt to reject the city the community lives in, but rather make living in these dense spaces more manageable. Community gardens in New York City attempt to weave to together the loose fabric that is the individual's interactions with the three layers of his city: his immediate neighborhood, the district within that neighborhood is found, and the city as a whole (Hassel 3). A common denominator among a variety of the theories investigated is the prominence of themes such as the restoration of the mind, identity, and environment which evoke an aura of sacredness in these spaces.

Spirituality in Gardens

A strong characterization of gardens is prominent in the world of spirituality. Upon the opening of the Cherry Tree Garden on 136th Street and Cyprus Avenue in New York City, the Cherry Tree Association invited the community to the event with an invitation that reference to

"Beltane, an ancient Celtic fertility festival," and to the Greek mythology figure named Gaia (Hassel 14). The Beltane festival is a deeply rooted Irish and Scottish festival held on May 1st that is used to signify the beginning of Summer. The festival is meant to celebrate a time of purification and transition ("Beltane - The Fire Festival"). Gaia in Greek mythology is the Earth Mother who was responsible for the creation of all things in the universe. She represents in lore the idea of an always-changing environment that must be "nurtured and protected as well as celebrated in its own right" (Hassel 14). James Lovelock, an environmental activist and scientist, developed the Gaia Theory inspired by the lore surrounding Gaia. In his theory, he postulated that the biosphere, which is the zone of all life on earth is responsible for sustaining life in virtue of regulating the Earth's environment. This theory has been strongly received by the environmentalist community and in turn has led to her imagery being incorporated into this brand of activism ("James Lovelock"). The use of Gaia as a symbol for these gardens signifies this element of mythology and spirituality attached to these spaces. Looking beyond Greek mythology, in ancient Japanese treatises on gardening, many pages were often singularly devoted to warning people, for their own safety, that it is "exceedingly harmful for a person of the Fire Nature to look at a red rock... with a Nandini plant facing it" (Cooper 62). Furthermore, some gardens are imparted with spirituality in the sense that certain elements incorporated into them are alluding to or symbolizing a grander idea. The Chahar Bagh is an Islamic and Persian quadrilateral garden with each of the four parts representing the four different parts of the Garden of Eden that is by portioned by four rivers which are symbolic of the four rivers of life. In Japanese Buddhist gardens, there would be stacks of rocks that represented the Isle of Immortals, a legendary mountain range believed to contain unlimited quantities of food, fruits that cured all diseases, and an absence of winter (Cooper 115). Lastly, early Japanese gardens

during the Asuka, Nara, and Heian periods were highly representational. During the Heian Period, gardens were a central element of aristocratic culture. The ponds in these gardens represented nobility and were used spaces to hold ornate parties and competitions. Even the orientation of how the water was channeled through these ponds alludes to Japanese lore. For example, the ponds were "created by a stream entering the garden area from the northeast" which symbolically stood for Japanese Guardian of the East, or "he who upholds the realm", and exiting in the southwest area which represents Guardian of the West, or "he who sees all" ("Early Japanese Gardens: The Asuka, Nara, and Heian Periods"). It is the reoccurring presence of these representational forces which underlines the idea that gardens have the ability to host significant symbolic power that can form connections, that persists outside the boundaries of that space, with people's personal lives. The symbolism present in these gardens heightens the cerebral experience one has while observing these elements in the sense that it evokes not only contemplation, but also meditation and memory related to the idea they are abstractly observing. The garden is not just a collection of plants and flowers, but a space than can also be metaphysically charged. As one engages with, for example, the Chahar Bagh, not only is he having a vivid sensory experience as he gazes at the streams of water and geometric partitions in front of him, but also a vivid perceptive experience that endows the garden with meaning and religious significance.

In the modern age, symbolism and spirituality in gardens can take on a different meaning. The British author and philosopher Iris Murdoch puts forward her philosophical stance regarding this topic in the following statement: "More naturally as well as more properly, we take self-forgetful pleasure in the sheer alien pointless independent existence of animals, birds, stones, and trees. Not how the world is, but that it is, that is the mythical" (Hassel 106). She was concerned,

like many of the writers, poets, and farmers in the modern industrial age, with the fragmentation of identity, community, and society as civilization evolved into a science and technology behemoth. Her like many others, believed that a remedy to the ailments of modern-day existence is brewed through the ability to engage in "self-rule", or a focus in individual existence (Hassel 107). Self-rule, as described by Simone Weil, a French philosopher who wrote against the backdrop of World War II and the growth of nationalism and wartime technology, is the impelling need for man to "appropriate, not materially or juridically, but in thought, the places and objects amidst which he passes his life. A cook says, 'My kitchen,' a gardener, 'my lawn', and this is as it should be" (Weil 62). It is through colonizing these intimate spaces that surround oneself that one fulfils a form of self-expression. Looking at this notion of self-rule through the lens of ecology and gardening highlights the spirituality, mythology, and religiosity formed through the creation and governance of these spaces. The continuous act of creating and maintaining a garden is a display of self-rule, an appropriation of place that encourages creativity and self-expression, if it be through what plants or flowers one decides to imbed into the soil, or through the aesthetic placement of these plants in relation to one another.

Gardens and the Community

Although we have looked at this exercise of personal dominion over gardens as a highly idiosyncratic act, it is simultaneously occurring at the community level. One is deriving significant individual value through these gardens, but this solitary experience is just one important piece of a greater, collective entity (Hassel 110). Returning to the ideology of the community garden movement discussed earlier, it can be argued that the coalition of community gardeners saturate nature with a mystical power and that their movement in New York City is an

attempt at "returning to an idealized concept of community existing in a symbiotic relationship with nature" (Hassel 109). These abstractions of community and collective identity are the overarching themes for what is highly individual experience. One's contribution to these gardens is a reflection of himself, but in the context of its surroundings, is one piece of a greater collage of personal identities and given that, it creates an essence of a community. The values shared by the creators of these gardens invigorate these spaces with conviction, and the gardens themselves can be abstractly viewed as artistic displays of not only individuality, but also a collective movement by a group of people. This characteristic legitimizes these gardens as constantly evolving and changing piece of arts and heightens their cultural significance.

Gardens and Hospitals

Many of the themes discussed in this chapter on gardens parallel the artistic and humanistic movements occurring in the second generation of functionalism. The community garden movement that occurred in New York City was philosophically charged with similar values as the modern functionalists like Alvar Aalto. The activists' mantra in regard to gardening was the following: gardening is a way of creating dominion over the dominating effects that global capital has on "vitality, creativity, and imagination." Gardens function as vehicles for exhibiting control over forces that are uncontrollable such as modernization and industrialization. The activists view gardens as a compromise for the setting they live in as an attempt to make life in these dense spaces more manageable. Alvar Aalto held very similar views in regard to the modern industrial era and all of its accessories, like standardization and mass production, as forces that cripple the "small man," forces that are inherently incompatible with artistry and

individualism, forces that removed people from nature. Aalto used architecture and nature to combat those very forces.

A commonality between the two movements is the protection of the individual and community identity in the wake of the modern era of civilization. Each movement also uses elements of nature as the tools for achieving their respective goals. There is something significant to be said about the role that nature, greenery, vegetation, etc. play in sustaining one's identity and personhood. This characterization of nature across multiple fields of arts speaks for the universality of its effects and benefits.

Because of gardens' highly spiritual, symbolic, therapeutic, and cultural importance, a strong case can be made for both the value and function of these spaces within a hospital. Anybody that has ever had to visit a hospital, if for one's personal health or for the support of close family and friends, one is aware of how sterile, cold, and bleak the environment is. While there are very recent examples of hospitals making great strides towards modernizing the design of health care facilities, like the Chickasaw Nation Medical Center in southeastern Oklahoma, many existing hospitals and care centers are dated and do not fully realize many design elements. One of these elements is the exposure to substantial amounts of green space, or nature. Healing gardens can be used to integrate the hospital and its occupants with nature, even if the hospital is located in a highly urban area. There are many potential benefits and uses that can arise from incorporating gardens into a hospital's stressful environment. They can provide a quiet, peaceful space for an individual who wants to remove oneself form a highly emotional setting. As discussed early, interactions with a garden are very cerebral experiences: they can easily evoke mental acts of contemplation, imagination, meditation, and memory. Because of this, healing gardens can function as a sanctuary for the occupant's spirit. Engagement with the healing

garden's atmosphere could alleviate the busyness of the minds for not only patients at the hospital, but also for visitors and staff members. As Iris Murdoch eloquently says, "more naturally as well as more properly, we take self-forgetful pleasure in the sheer alien pointless independent existence of animals, birds, stones, and trees" (Hassel 14). Patients and visitors who must stay multiple days, weeks, or months in hospital could utilize these spaces as a means of escape from the hospital room. Not only could healing gardens be used for idiosyncratic purposes but can also be used to build a community within the hospital. The Paimio Sanatorium features rooms, balconies, and decks that overlook a garden area designated for activities like exercise, occupational, and work therapy. The idea behind this is that by incorporating the gardens into the natural layout of the building, rather than hiding or partitioning it off, patients would be able to easily observe other patients going outside and exercising. This encourages those people indoors to walk along the long, meandering pathways within the garden. Through this placement and utilization of the garden, a sense of community is established in two ways: (1) in virtue of being able to visibly witness other patients walking around outside and interacting with the gardens and natural landscapes, it makes one's experience at the hospital less isolating and alienating. The patient is getting a constant reminder that there are other people going through a similar plight to what he or she is experiencing. In a tuberculosis center, those who are outside in the garden walking around naturally display a sense of healthiness and vigor given the debilitating side effects of the illness. Therefore, these people also are reminder to an observer that it is possible to recover one's strength and health. This contributes to a collective mentality among the patients of wanting to overcome the sickness they are being treated for. (2) People were bound to run into each other and become acquaintances or friends by spending time in the garden. According to a management plan of the sanatorium, "Aalto abandoned the romantic

walkways for the sake of a far more efficient arrangement: to encourage exercise Aalto planned a series of five fountains with a zig-zag walkway connecting them" (Eylers 106). This required people to spend longer amounts of time on the walkways not only for exercise, but to also foster friendships and relationships among the patients as they would go on walks together or meet people along the pathways. Healing gardens can mimic Aalto's intentions and designs to bring all types of patients together naturally or through group classes and exercises, for example. Healing gardens can also strengthen community awareness through the use of culturally symbolic elements. A garden could possible include a mural, a statue, a plaque, or a style of furniture that has strong representative powers. Or it could include plants, flowers, and vegetation that is unique to that region. Both manmade and natural elements have the ability to symbolize cultures, lifestyles, and ideas. These representational forces endow gardens with significant symbolic power that can form relationships with people's personal lives and create a sensation of togetherness among those interacting with the space. However, a valid counter argument to this is: what if the patient of a hospital is of a different culture or was born in a different city, state, or country? Could elements that are very unique to a specific culture actually serve the opposite purpose of what was intended, and rather alienate the individual observing them?

Why Are we Drawn to Nature?

It is difficult to quantifiably describe and capture the benefits that result from a space being "spiritual" or "culturally symbolic and significant" because these concepts are very abstract and elusive. There doesn't exist an absolute measure of the "atmosphere" of a place, as a person's experience of a space is entirely subjective; dependent on his or her mental framework.

Even attempting to define what exactly constitutes one's cultural or spirituality is a confusing and sometimes ineffable task. The same effect can happen when one tries to explain why he is she likes to be around natural features like yards, trees, rivers, lakes, and mountains. The question does not occur to many people why we would like to live in a home with a back yard, or why we decorate our patios with plants and flowers, or why we take weekend trips to the lake or mountain? These seem like things that we "just do" as normal people because they make us feel good; they clear our head; they get us out of the city; they break up the routine. In the same vein as the Paimio Sanatorium being burrowed deep within Finland's dense forests, or a garden nestled in between two New York City Brownstones, nature is commonly treated as a place of "escape" from dense urban environments. There are many methodical studies and theories the aim to better understand *why* we feel the way we do about nature and *why* we have this intrinsic need to be surrounded by nature. One leading theory about human's inclination towards nature is that we have an "evolutionarily derived preference" that has over time, caused people to focus on and "positively respond to features and configurations that have been conducive to survival" such as shelter, shading, water, and vegetation (Reeve and Desha 50). Therefore, because of this evolutionary and genetically derived affinity with nature, nature can be a powerful tool in physical and mental healing. It has also been theorized and studied that enveloping oneself in nature has restorative effects on stress and attention rates, an idea which has been coined the term "Attention Restoration Theory." An exposure to sunlight and vegetation have restorative effects in health that are often hampered by extended exposure to darkness or artificial structures.

Numerous multi-modal studies have used a blend of verbal and physiological measures to analyze the natural environment's influences on stress recovery. These studies are framed by the Attention Restoration Theory which postulates that exposure to the natural environment will aid

one's capability to maintain 'directed attention', a quality that is subject to limitations (Reeve and Desha 50). Directed attention, as defined in "The Restorative Benefits of Nature: Toward an Integrative Framework" by psychologist Stephen Kaplan, is an ability that "requires effort, plays a central role in achieving focus, is under voluntary control, is susceptible to fatigue, and controls distraction through inhibition" (Kaplan 170). For any sustained mental exertion, the ability to maintain directed attention is depleted and fatigued. The inhibitive physiological and psychological impacts from directed attention fatigue are diverse and each carry significance in their own respects. Focused thought, inhibition and action, and one's overall mood are elements that are negatively impacted by the ability to maintain mental focus on a task or person (Kaplan 172).

Exposure to nature, as explained by the Attention Restoration Theory, serves as a panacea for these forms of mental fatigue. Natural environments, as argued by scholars, must fulfill criteria to be restorative to attention and mental fatigue: it must evoke a "sense of being away, physically or conceptually, from the attention demanding tasks, richness and coherence of detail so as to be perceived as a 'whole other world,' a sense of fascination such that attention is effortlessly captured… and compatibility with an individual's purpose and inclinations such that they can relax" (Reeve and Desha 50). To explore the effects of nature on directed attention in a controlled setting, a study was conducted on a sample of 72 undergraduate students, segmented by the design of their dormitory windows on the basis of the view of nature each window offered. A dormitory window that provided an "all built view" was wholly obstructed by either buildings, brick walls, or city streets. A "mostly built view" had a large portion of its view covered by those artificial constructions. A "mostly natural view" was almost fully of nature, but had lingering elements of human design, such as benches, sidewalks or post lights. Lastly, an

"all-natural view" is entirely enveloped in natural elements (Tennessen and Cimprich 80-81). After categorizing students into those four groups, numerous neurological tests and checkups were conducted to measure the effects of exposure to nature on cognitive abilities. The Digit Span test, requiring subjects to mentally hold and recite digits in reverse sequence, and the Attentional Function Index (AFX) which asked for the participants to rate on a scale of 1-10 how phrases related to activities requiring "directed attention, planning, deciding, following a train of thought, and concentrating on details" are examples of measures used during the study (Tennessen and Cimprich 79). The conclusion of the study was that those whose windows had unobstructed views of nature performed significantly better in all metrics of cognitive tests in regard to attentional functioning and the ability to direct attention than those with an "all built" or "mostly built view" (Tennessen and Cimprich 83). The most complex of tests, the Symbol Digit Modalities Test (SDMT) which entails "substituting numbers for a random presentation of 10 geometric symbols including three minor image pairs, according to a specific key," especially confirmed the enhanced attentive abilities of the students exposed to natural views (Tennessen and Cimprich 79). Fully and partially obstructed window views were most associated with lower cognitive testing scores. This study corroborates the idea that nature positively impacts our ability to focus which then plays a role in bettering our mood and lowering our stress levels.

Exploring Solutions to Mental Fatigue in Hospitals

The conclusions reached by the study performed at the university dormitories can be extrapolated and applied to the healthcare environment. Like the expected and required hours of studying and direct focus on school material that students experience, which inevitably becomes mentally straining, health care professionals spend the majority of their time at work channeling

their mental efforts towards aiding the patients at their facility. Nurses and physicians at hospitals are often called into work at unusual times and have to work extended shifts to meet the demand of those in need of medical assistance, leading to increased stress, drowsiness, and fatigue levels and unhealthy shifts in sleep and wake patterns. The effect of demanding work hours puts patient safety at risk because of the safety-critical tasks performed by the staff. In a study conducted over a span of twenty-eight days, over two thirds of hospital staff nurses reported "struggling to stay away on duty at least once" and that they fought falling asleep "once every five shifts or 2,258 out of 11,218 shifts" (Scott, Hofmesiter and Rogers 250).

While the solutions for the excessive workloads and consecutive shifts for nurses might require reevaluating the inherent structural organization of healthcare systems, such as the delegation and redistribution of tasks among hospital staff, an effective way of helping dampen the consequences of these working conditions, while maintaining the framework of which a healthcare facility operates, would be to include green spaces and natural relief in the facilities themselves. As discovered in the dormitory study, exposure to nature is correlated with increased cognitive capabilities such as the ability to maintain direct attention on a task at hand as well as decreased stress levels. Staff members, visitors, and patients only can benefit from this exposure.

Many studies already exist that confirm a link between exposure to nature and positive health outcomes:

> "After gallbladder surgery, patients recovered faster and with fewer strong pain medications when windows faced a natural view rather than a brick wall. Similar results emerged with cardiac surgery patients randomly assigned to rooms with a picture of a nature setting compared to rooms with no picture, a blank screen, or an abstract picture" (Shermna, Varni, Ulrich, and Mclarne 169)

Being bed-ridden due to surgery, sickness, or treatment is mentally straining in itself. One's physical motions are limited and if one is able to freely move around, the space around him or her is limited: the hallways are narrow and hospital rooms are often shared with another person and divided by a curtain, giving each patient only a few square feet to inhabit for hours, days, or even weeks. Exposure to nature can serve as distraction of these conditions. Distractions, or "cognitive refocusing" has been "demonstrated to be an important coping strategy for pediatric patients in pain" (Shermna, Varni, Ulrich, and Mclarne 170). To help alleviate a patient's stress and mental strain, vegetation and areas of natural relief are employed in hospitals at both the micro and macro level. At the micro level, windows to the outside are built into rooms, images of nature are hung from the walls of lounge, and patient rooms or plants are placed at bedside tables or in the corners of a room. At the macro level, healing gardens are built into hospitals.

Healing Gardens: The Demographics of its Usage and its Impacts on Health

Nestled within Rady Children's Hospital, a cancer center in Southern California is a series of healing gardens known as Carley's Magical Gardens (See Appendix D); three spaces that aim to provide a serene, calming environment for all inhabitants at the hospital (Shermna, Varni, Ulrich, and Mclarne 170). The spaces feature a wide variety of elements besides rudimentary additions such as benches, sidewalks, trees, plants, and flowers. "Brightly colored butterflies" line the walls, sculptures and mosaics of turtles and cranes are burrowed between shrubs in the Garden of Dreams, life-sized playhouses and toys are scattered around the Friendship Garden, and a "caterpillar shaped bench" sits in the Buggy Garden (Shermna, Varni,

Ulrich, and Mclarne 170). Patient rooms line the barriers of these gardens, allowing for windows to offer a view the natural space. To explore the outcomes stemming from the design of the three gardens, an observational study was conducted on a collection of 1400 patients, hospital staff members, and visitors, each varying significantly in age and ethnicity. 45% of the sample size, or 630 of participants, were visitors, 45% were staff members, and 4% were patients at the hospital (Shermna, Varni, Ulrich, and Mclarne 170). The results from the observations reveal that the three healing gardens at the children's hospital were being most utilized by adult staff members and adult visitors rather than by the adult or child patients. The demographics of the three gardens varied greatly: the Garden of Dreams population of 744 people consisted of 70% visitors, 25% staff and 5% patients, the Friendship Garden of 432 people had a presence of 84% staff, 13% visitors, and 3% patients, and lastly, the Buggy Garden, the least popular of the three with a population of 148 people, had nearly half of its occupants be visitors and the other half be staff members (Shermna, Varni, Ulrich, and Mclarne 175). An examination of the activities performed by patients, visitors, and staff while in these gardens, as well as their self-reported measurements of feelings such as "anxiety, sadness, anger, worry, fatigue, and pain" can help form a more crystallized image of who benefits most from certain architectural design elements. Insights gained from this exploration can possibly allow for these spaces to be more efficiently designed for the targeted demographic it aims to aid.

While in the healing gardens, hospital staff members most often engaged in activities that were self-alienating: they most often spent their time "eating lunch, sitting and talking with colleagues, or relaxing," while less than 10% of the staff actively interacted with the features of the gardens or conversed with patients or visitors (Shermna, Varni, Ulrich, and Mclarne 176). In fact, the time typically spent among 55% of the users totaled less than one minute, meaning that

the garden often functioned as a space to "walk through" (Shermna, Varni, Ulrich, and Mclarne 176). A potential reason for why the staff members congregate to the Friendship Garden is explained by its location in the hospital: it is enclosed by the staff and administrative offices, allowing for the employees to easily access the garden when needed. The intentional placement of the gardens near hotspots for both patients and staff exemplifies the architectural foresight used when designing the green space's blueprints. The Garden of Dreams is more oriented for the parents and adult visitors at the hospital: it is located in the middle of the surgery department, the cancer patient rooms, and hematology–oncology corridor. It is a heavy transit area in the hospital, and it is common for parents to spend time in this space during a child's surgery or stay in the cancer center. Adults most often interacted with features, such as benches and fountains, that allowed for person to person interactions – a majority (35.5%) of adults observed spent their time sitting and talking, followed by walking around (22.7%), and sitting and relaxing (20.7%). (Shermna, Varni, Ulrich, and Mclarne 177). The study also found that time spent in the gardens significantly lowered feeling of anxiety, sadness, and worry by at least 50% in relation to the emotions felt while inside the hospital (Shermna, Varni, Ulrich, and Mclarne 179).

One shortcoming of the garden's design, however, is found in the placement of the windows to patient rooms alongside its perimeters. It was reported that only 21% of window blinds were open at a given time, and that a highly negative correlation existed between window usage and the amount of people in the garden (Shermna, Varni, Ulrich, and Mclarne 178). This can clearly be explained by the desire for privacy by the patients and their family members during times that are emotionally and physically straining. Because the window blinds are often shut, they aren't effectively functioning as intended to, which is to provide natural views for the patients.

Reflections on Healing Gardens Though Anecdotal Evidence

One study refined the scope of its research to an inner city children's hospital in Brisbane, Australia, a contemporary facility that encapsulates a "salutogenic approach" to design, containing attributes such as "clear wayfinding, connections to the outside, and views of nature" as a means of "providing a green and sustainable environment" (www.archdaily.com). The Lady Cilento Children's Hospital (LCCH) (See Appendix C) features an impressive 11 healing gardens, each of which is specialized and designed for a unique function and demographic with names such as "Babies Garden," "Shared Gardens," "Staff Garden," "Rehab and Adolescent IPU Garden," "Secret Garden," "Adventure Garden," "Visual Garden" (Reeve and Desha 50). Researchers analyzed the effects of these healing gardens on patient outcomes and whether their experience in these spaces aligned with their architectural intentions.

Using bench diaries left out in four of the gardens, the researchers transcribed and analyzed the journal entries written by staff, patients, and visitors over the course of a four-week period. Upon collecting the entries, the team then identified reoccurring and common themes that encapsulated the varying feelings, actions, and moods of the garden's visitors (Reeve and Desha 53). The frequency of which the themes occurred throughout the diaries measured how people most commonly felt and acted in these spaces. The following comment left by a parent whose child underwent surgery at the hospital speaks for the benefits the "Shared Garden" brought to its visitors: "We are here with our 6 weeks old daughter. After more than a week in hospital without spending time in the sunshine and fresh air, I found this garden all the beautiful plants made me cry. We miss our home and this garden really helps" (Reeve and Desha 55). Other comments were left in the same vein, one patient writing "I am sick and staying the hospital and I came up here to have some fresh air and enjoy the view," and a staff member describing "loving coming

outside of tea breaks… it is so nice to get some fresh air and admire the views" (Reeve and Desha 55). The largest amount of comments was related to restoration and stress reduction: many of the visitors remarked actively seeking out these spaces to relieve themselves from emotional trauma experienced during their stay at the hospital (Reeve and Desha 55). The study concluded that these healing gardens do act as a vehicle for "alleviating the emotional impact of being in the hospital" (Reeve and Desha 54). All visitors primarily used the green space as an escape from the hospital - it provided relief from the sterile look of a hospital and a "break from focusing on the trauma and illness they are experiencing" (Reeve and Desha 54). Many of the visitors commented on the sense of privacy and separation that the plants and garden brought to them, as well as the diversity and greenery and plants.

Elements of a Successful Healing Garden

Using humanism and functionalism as the ideological infrastructure and green space designs that evoke the most interaction and emotional catharsis, one can determine what are the best features and approaches an architect can implement when constructing a healing garden within a medical building. The "best features" are ones that are most valued by patients, staff, and visitors and that efficiently serve a clearly defined purpose. Because healing gardens are a significant financial investment for hospital administrators, it is crucial that the design of and additions made to the gardens provide the most utility. As already seen by studying the Paimio Sanatorium, Rady Children's Hospital, and The Lady Cilento Children's Hospital, landscaping and gardening are playing increasingly larger roles in the blueprints of healthcare structures. Each hospital demonstrates a progressive way of treating illnesses by considering both the physical and psychological effects of green spaces. The commonalities between these three

facilities can be divided and investigated on a macro and micro scale. On the macro level, the each of their landscaping stimulates social solidarity, such as the congregation and interaction with others, if through exercise, conversation or interaction with the outside, but also can provide an environment to be alone and be introspective. At the Rady Children's Hospital, the gardens were not designated for a specific demographic, yet the qualities of each one lead them to be most utilized most by either the patients, staff, or visitors. For example, because one garden bordered the administrative offices, it was primarily occupied by staff members who recorded spending their time by themselves and not interacting with patients or others. Although this space was not designated specifically for staff members, their strong presence might deter others from visiting it, as to not disturb or intrude them while they are on their break. Because of this, that garden is not being efficiently used and the design unintentionally creates something that has an unspoken exclusivity. The Lady Cilento Children's Hospital took this dilemma into account and designated each of its natural gardens for a specific purpose or crowd, therefore ensuring its residents can feel secure in them and not out of place. Lastly, on the macro scale, the facilities "provide positive experiences to encourage interest, stimulate senses, and arouse curiosity for people in healthcare settings" (Chang and Chien). Looking at the grander picture, each provides physiotherapy for its visitors (Chang and Chien). At the micro level, windows and balances that offer views of vegetation, while maintaining one's privacy, are important determinants for the capability of the senses, stress, attention, and responses. At the Rady Children's Hospital, privacy was a big concern as only one-fifth of all patient room windows overlooking the gardens had their blinds open. Privacy, especially in times of suffering, pain, and vulnerability is paramount. The design should allow for people to comfortably interact with or view the garden's features without compromising their personal privacy. Areas of shelter, tree coverage, and bench

seats are the most important design features for the patient group because they are all tied to low level and “low impact activities” (Chang and Chien). A combination of all these design elements with an ideological focus on the patient experience and functionality will yield the most beneficial healing garden.

Dell Children’s Medical Center Field Work

Dell Children’s Medical Center (DCMC), located in Austin, TX, is a children’s general medicine and surgical center built in 2007 (See Appendix A). The hospital features a collection of mutli-level gardens enclosed in a courtyard in the center of the building. The inside hallways that encircle the courtyard are lined with windows of various shapes and colors, providing a 360-degree view of the gardens at all times. Each of the gardens has unique features that cater to specific types of behaviors and needs of the hospital’s occupants. To get a holistic perspective on the healing gardens at DCMC, I visited the medical center twice on random weekdays and once during a random weekend, each at different times of the day. On the days visited, the sky was clear, and the temperature was moderately warm, ranging from 75-85 degrees. I avoided cold or rainy days because inclement weather discourages people from spending time outside. The research I conducted was strictly observational. I not only took notes on how the gardens were designed, but also on how the patients, visitors, and staff interacted with these spaces. Before introducing my observations, it is important to note that because DCMC is an urban hospital, the gardens and natural elements are enclosed within the building itself, rather than integrated with the hospital’s surrounding environment. The gardens feel like a fishbowl: anyone can easily look into these spaces which are meant to be areas for meditation and solitary. This quality can deter people from spending time in the gardens because their privacy is compromised, and it is very

easy to ponder if anybody from the interior is watching them through the windows. At the same time, it is important to not just judge the efficacy of the healing gardens based on how many people are actually spending time in these spaces, but also look at the impact the gardens have on the overall experience of staying at the hospital.

The first-floor garden, referred to as the "Healing Garden" is located outside of the cafeteria. It features multiple tables of varying lengths to accommodate small and large groups of people. The patio area sits next to a flowing waterfall and a meandering river of water. Large rocks nearly fifteen feet high and 100 feet wide covered in dark green shrubs enclose the space. The sound of the waterfall provides a pleasant background noise for those who are spending time in this garden. During the first day I visited, a Friday in April from 12PM to 2PM, this was the most occupied space. At one point in that time frame, ten different people were eating and talking together in the "Healing Garden." Some tables had seven people sitting together, and others had one to two people. During those two hours, twenty-four people entered and left the garden. People typically spent twenty to thirty minutes eating lunch, conversating, or sitting by themselves. Of the twenty-four people, twenty were hospital staff and four were visitors. During lunch, only staff members ate outside at tables. Only after lunch had ended and staff members returned inside did a family of four people go and sit outside at one of the tables. During a visit on a Saturday afternoon from 5:30PM to 7PM two visitors spent time in the space: one young adult ate food by himself and another woman sat at a table photographing the trees around her. On Tuesday from 8:30AM-10:00AM, nobody entered this space.

The second-floor patio is called the "Healing Courtyard." It is much larger than the first-floor space and features shaded and un-shaded benches, an artificial stream that flows from a waterfall, open spaces of grass, many plants, flowers, and trees, and ledges placed alongside the

water features. It is located directly in between the inpatient wing, the play/creative therapy rooms for kids, the sleep lab, the family lounge, and the rehabilitation center. The "Healing Courtyard" was occupied by seven people in total during 12PM-2PM on a Friday afternoon. A variety of the features were used by all the occupants. Five visitors sat on the bench shaded by a large tree. They spent this time either talking with each other or talking on the phone. All seven people interacted with the artificial stream and waterfall by either running their hands through the water or sitting alongside its ledges together. The space allowed for groups of people to spend time together and also provided spots where one could sit privately and read or make a phone conversation. During the Saturday afternoon visit from 5:30PM to 7PM, three people entered the garden. One lady sat on the ledge by the waterfall to make a phone call then returned back inside after ten minutes. A young patient and her father also spent roughly three minutes in the garden, leaning against the balcony and hugging each other. On Tuesday from 8:30AM-10:00AM, nobody occupied this space.

The third-floor patio, known as the "Schmidt Garden," features a balcony over-looking the lower levels, a small two-step staircase with railings, raised orange pots containing a variety flowers, multiple benches, and a colorful floor that is painted with vibrant greens, blues, purples, and yellows. This garden is accessible using two doors: the first door is in the hallway adjacent to the inpatient wing, Child Life Specialist offices, family lounge, and play/creative therapy rooms, and the second door opens up to a therapy gym. The Neonatal Intensive Care Unit (NICU), a special treatment area for newborn babies, is also located on this floor. There is no access from the hallway parallel to the inpatient wing on the other side of the building. This side contains mostly administrative offices. Between 12PM and 2PM on Friday, seven people visited the "Schmidt Garden." The garden was intentionally designed to be used by the visitors and

patients due to its close proximity to the wings, lounges, and offices mentioned above. By excluding an entrance through the administrative side, staff are discouraged from entering this garden. The demographics of those people who used the space were one patient and seven visitors. Of the six visitors, one middle-aged couple with their young daughter, one a grandparent, one father, and a young-adult couple. The bench and balcony were the most interacted with features of the garden. The one patient sat on the bench for roughly fifteen minutes, looking at the environment around him, and then returned back inside. Both couples sat together on the bench, embracing each other, conversating, and observing the space together. The one father used the bench to make a phone call. All the visitors interacted with the balcony in this garden, using the railing to lean against and look out towards the bottom two levels of the garden – an impressive view of greenery and running water. Each of the visitors spent around five minutes in the Schmidt Garden. Like the "Healing Courtyard," the "Schmidt Garden" is a space that allows for people to be together and for people to have privacy and be alone, as exemplified by how people used the garden. On a Saturday, from 5:30PM-7PM, and on a Tuesday from 8:30AM-10:00AM, nobody spent time in the "Schmidt Garden."

The fourth-floor garden is the smallest of the four gardens in this courtyard and features a crescent-shaped flat cement bench. The door was locked the first day I visited and therefore nobody was allowed into the garden. The last garden looked at is located on the opposite side of the medical center. It is only accessible through the chapel on the third floor of the hospital. The garden is named the "meditation garden" and features singular benches that are separated by tall stone walls to provide a quiet and private place to sit down. Nobody entered the "Meditation Garden" during the days I visited.

Although there were less patients and visitors that physically entered and interacted with the multiple gardens than I expected, the healing garden still plays a somewhat significant role in one's experience at the hospital. Because the main hallways in the hospital surround the garden, one has almost constant exposure to the natural space. I saw a handful of adults go up to window out look out into the gardens while they spoke on the phone. Children often walked up and down the hallways, looking through the windows at the garden. Parents carrying their kids through the hallways would point out the trees or river to their children. As one couple exited the inpatient wing, I overheard the mother say "sunlight, daylight; such a nice day." I overheard a staff member giving a tour of the hospital to a family, making an effort to emphasize the healing gardens and their accessibility from all the floors. I had a minor interaction with a patient at the hospital – I opened the door to the "Schmidt Garden" for him because he was walking with an IV pole. After he came back inside, he thanked me and after explaining the research I was conducting, he responded that he "loved this garden because [he] is always in his hospital room and [he] can now go outside." Just by these interactions and comments I witnessed and heard, I got the strong impression that these gardens are strongly interwoven into the experience of staying at the hospital, if it through a window or through physically entering the gardens themselves. The gardens and natural features are the centerpiece of the hospital's design.

However, it is difficult to pinpoint why more people were not spending time outside. The garden is easily accessible from multiple entrances on all floors of the hospital, so its location is not what is preventing people from using the gardens. Although, I did notice that patients with an IV pole had difficulty opening the doors to the garden and pushing the heavy pole over the threshold while simultaneously keeping the door open. Automatic doors, or a button feature to automatically open the doors, would be in the patient's best interest. Referencing the studies on

healing gardens at children's hospitals that were presented earlier in the previous chapter, patients represented the smallest demographic of people interacting with the gardens. Perhaps one's age plays a role in determining if somebody is physically or mentally inclined or able to into the healing gardens. Or, because children patients are often accompanied by their parents when they leave their hospital rooms, their parents might defer from spending time together outside for personal reasons – the very young children in the gardens were always accompanied by a parent. When looking at the multiple levels of healing gardens, there were not many features that were designed specifically for children. The colorfully painted grounds on the second and third floor have some juvenile appeal and design to them, but the gardens as a whole feel "adult-like." Besides the benches, artificial stream, and waterfalls, there are not any features for children to directly play or interact with. If the gardens were to include more recreational equipment, such as items found in playgrounds like mazes, sandboxes, chalks, and seesaws, the space might be more alluring for children. The overall impression the healing gardens at DCMC left on me was that while they do provide natural relief to all the hospitals occupants, the gardens themselves are catered to emotionally aid family members through the child's treatment.

Conclusion

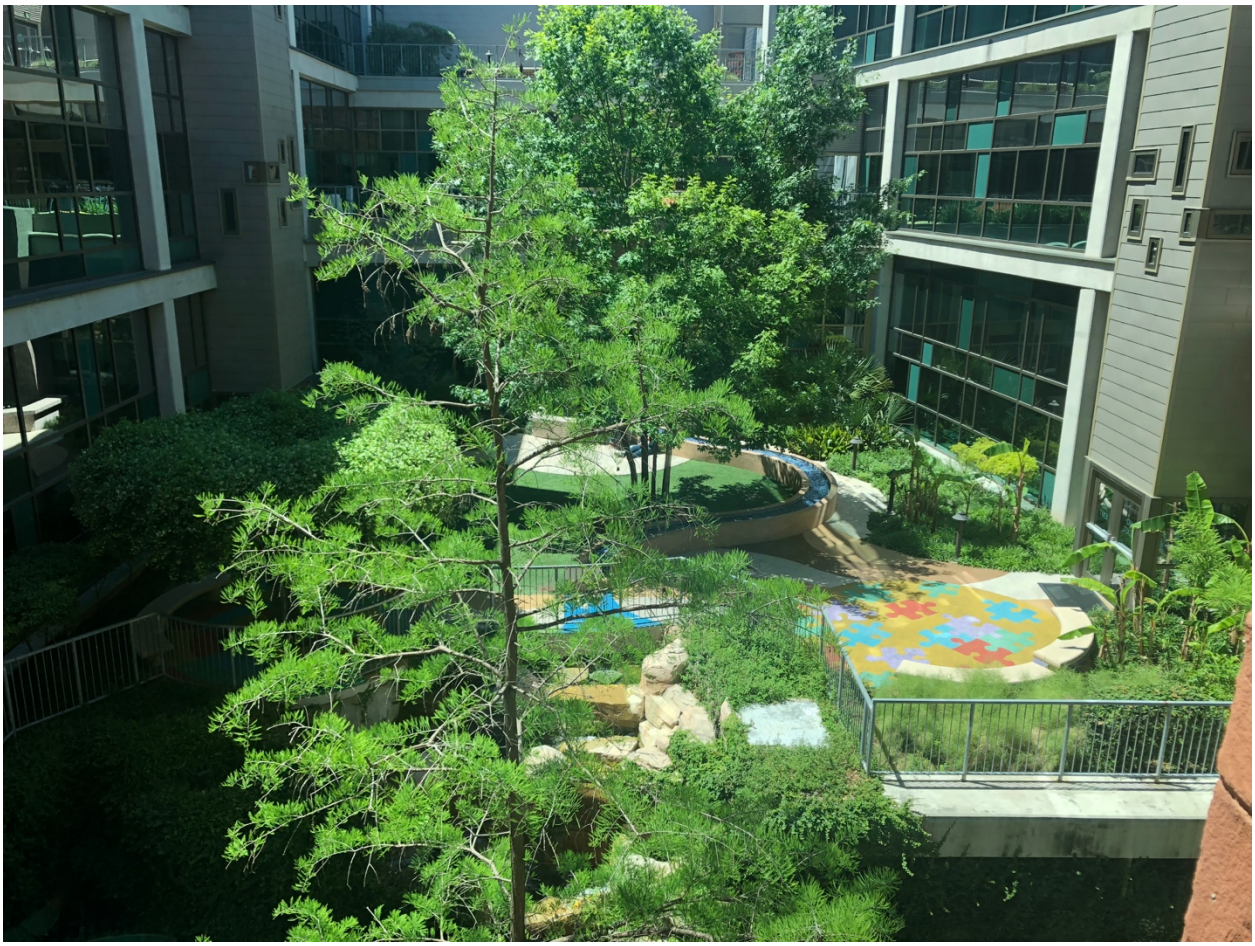
The positive impacts of nature on one's physiological and psychological health have not only been the focal point of much literature and philosophy but have also been corroborated by countless scientific studies. Architects of hospitals have an ethical obligation to prioritize the emotional needs of patients, staff, and visitors, and one way this can be accomplished is by integrating natural features into the design the building. Healing gardens allow for nature and artificiality to coexist if a hospital is located in an urban location.

Although exposure to nature and gardens provides very positive health outcomes, the design of the healing garden can either facilitate or impede the degree of those benefits. In order to fully realize the potential advantages of using these spaces as instruments for healing, architects must consider the following qualifications: (1) the healing garden must facilitate an interaction with nature (flowers, plants, vegetation, trees, fountains, running water, etc.) (2) the healing garden must provide a space that prompts conversations, friendships, and social solidarity (3) the healing garden must also allow for its occupants to seek privacy within the space if they wish to be alone. These three conditions encapsulate the needs of those occupying the healing gardens.

In a hospital equipped with advanced technology, instruments, medicine, and procedures, it can be easy to forget the impact that the building itself, which houses these revolutionary features, has on the occupants' health. There needs to be an open conversation between architects and health care professionals to build a space that does not sacrifice the design of the hospital for the medical needs of the occupants.

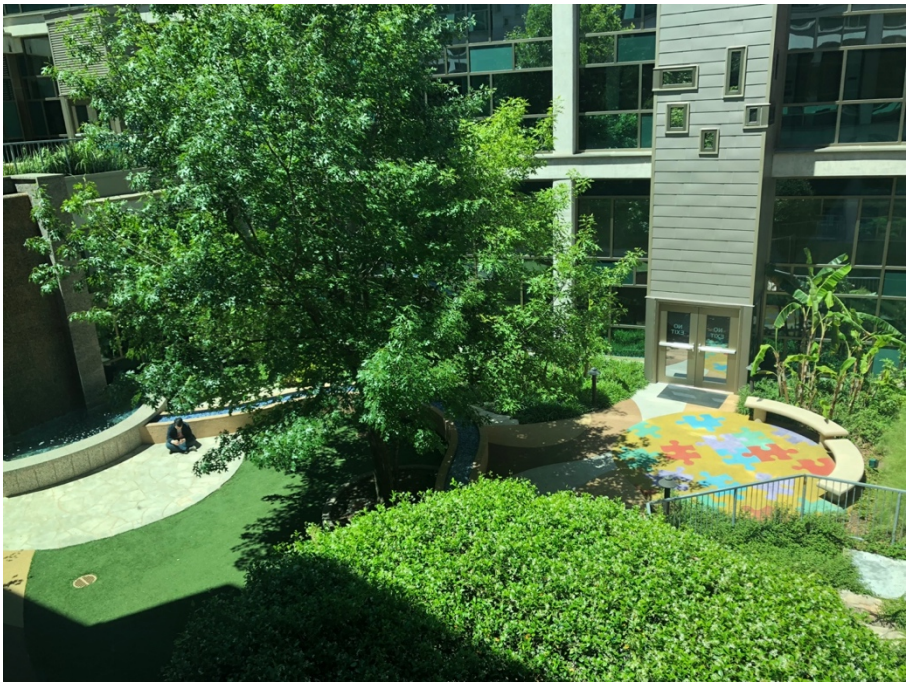
Appendix A

The four-level healing garden at Dell Children's Medical Center in Austin, TX. Hallways surround the courtyard, providing a constant view of the space. All photographs taken by Aaron Quintanilla.



The “Schmidt Garden” at Dell Children’s Medical Center on the third floor.

The “Healing Courtyard” at Dell Children’s Medical Center located on the second floor.



The “Meditation Garden” (first two photos) and “Myrna and Louis Binder Garden”

The “Healing Garden” on the first floor of Dell Children’s Medical Center, located outside the cafeteria.

Appendix B

The Paimio Sanatorium by Alvar Aalto located in Finland. Photo by Soile Tirilä.

Patients wings are lined with windows so there is constant exposure to nature. Photo by Soile Tirilä.

Patients would lay out on the sun deck as part of their treatment. Photo by Gustaf Welin.

Another view of the sun deck. On the right are the walking trails and fountains providing a space for patients to exercise and socialize. Photo by Gustaf Welin.

Pictured below are patients playing skittles in one of the hospital's garden areas. Photo by Gustaf Welin.

A patient's room that is oriented to accommodate those laying on their back for a majority of the day. The sinks pictured here are noiseless and prevent splashing. Photo by Soile Tirilä.

A single lamp in the room placed behind a patient's head. Photo by Soile Tirilä.

Appendix C

The secret garden at the Lady Cilento Children's Hospital in Brisbane, Australia. Photo by Christopher Frederick Jones.

The Adventure Garden. Photo by Dianna Snape.

Appendix D

The Garden of Dreams (top) and Friendship Garden (bottom) at Rady Children's Hospital in southern California. All photos by Angela Reeve.

The Buggy Garden at Rady Children's Hospital. Photo by Angela Reeve

Appendix E

This appendix features photos of community gardens in New York City. The first three photos are of El Sitio Feliz, “a large 20,000 square foot community garden that also includes to a playground, amphitheater, and large vine-covered pergola” (“El Sitio Feliz”). All photos are taken from www.grownyc.org.

El Sitio Feliz

A dedication ceremony at the El Sitio Felix community garden.

Children playing at the El Sitio Felix garden in 1992.

The Marian S. Heiskell Garden, founded in 1997, located behind the Salvation Army headquarters on 15 West 48th Street Clinton, Manhattan.

Marian S. Heiskell Garden, 2003

The Children's Aid Society gardens located in Harlem, New York City.

Bibliography

Aalto, Alvar, and Göran Schildt. *Alvar Aalto in His Own Words*. Rizzoli, 1998.

Adams, William H. *Gardens through History: Nature Perfected*. New York: Abbeville, 1991.

Anderson, Diana. "Humanizing the Hospital: Design Lessons from a Finnish Sanatorium." *Advances in Pediatrics.*, U.S. National Library of Medicine, 10 Aug. 2010, www.ncbi.nlm.nih.gov/pmc/articles/PMC2917967/.

Anderson, Stanford, et al. *Aalto and America*. Yale University Press, 2012.

Bachelard, Gatson. *The Poetics of Space*. Beacon Press, 1994.

Bálint Gárdos (2018) Aesthetics and landscape history: Intersections, Studies in the History of Gardens & Designed Landscapes, 38:4, 353-357, DOI: 10.1080/14601176.2018.1505140

"Beltane - The Fire Festival." Newgrange Stone Age Passage Tomb - Boyne Valley, Ireland, www.newgrange.com/beltane.htm.

Chang, Kaowen Grace, and Hungju Chien. "The Influences of Landscape Features on Visitation of Hospital Green Spaces—A Choice Experiment Approach." *Advances in Pediatrics.*, U.S. National Library of Medicine, July 2017, www.ncbi.nlm.nih.gov/pmc/articles/PMC5551162/.

Curtis, William (1986). *Modern Architecture since 1900*. Phaidon Press.

Cooper, David Edward. A Philosophy of Gardens. Clarendon Press, 2011.

"Early Japanese Gardens: The Asuka, Nara, and Heian Periods." Heiji Scroll - Introduction, learn.bowdoin.edu/japanesegardens/origins.html.

"El Sitio Feliz." *www.grownyc.org. Accessed 9 May 2019 < https://www.grownyc.org/openspace/gardens/man/elsitio>*

Eylers, Eva, et al. *Paimio Sanatorium Conservation Management 2016*. Alvar Aalto, 2016.

Giedion, S. *Architecture, You and Me*. Harvard University Press, 1958.

Gili Merin. "AD Classics: Ville Radieuse / Le Corbusier" 11 Aug 2013. ArchDaily. Accessed 10 Jan 2019. <https://www.archdaily.com/411878/ad-classics-ville-radieuse-le-corbusier/> ISSN 0719-8884

Gold, John R. "Creating the Charter of Athens: CIAM and the Functional City, 1933-43." *The Town Planning Review*, vol. 69, no. 3, 1998, pp. 225–247. *JSTOR*, JSTOR, www.jstor.org/stable/40113797.

Griffin, David M. *A Study of Functionalist Theories in Architecture*. 1966, *A Study of Functionalist Theories in Architecture*.

Hassell, Malve von. The Struggle for Eden: Community Gardens in New York City. Bergin & Garvey, 2002.

Jones, Christopher Frederick. "Shared Garden." *Healing gardens in children's hospitals: Reflections on benefits, preferences and design from visitors' book.*

Kaplan, Stephan. "The Restorative Benefits of Nature Towards An Integrative Framework." *Journal of Environmental Psychology* , vol. 15, 1995, pp. 169–182.,

ac.els-cdn.com/0272494495900012/1-s2.0-0272494495900012-main.pdf?_tid=9ac0934f-b45e-4ecd-ae87-c0285734a90a&acdnat=1525727403_d3cf2c5e7bd21a523bcd5b53e259dc92

"James Lovelock." Wikipedia, Wikimedia Foundation, 3 Dec. 2018, en.wikipedia.org/wiki/James_Lovelock.

Miller, Mara. The Garden as an Art. State University of New York Press, 1993.

Popova, Maria. "Famous Writers on New York: Timeless Private Reflections from Diaries, Letters and Personal Essays." Brain Pickings, 14 Mar. 2016, www.brainpickings.org/2013/09/17/famous-writers-on-new-york/.

Reeve, Angela, et al. "Healing Gardens in Children's Hospitals: Reflections on Benefits, Preferences and Design from Visitors' Books." *Urban Forestry & Urban Greening* , vol. 26, Aug. 2017, pp. 48–56. *ScienceDirect*.

Reeve, Angela. "The Buggy Garden." *Healing Gardens in Children's Hospitals: Reflections on Benefits, Preferences and Design from Visitors' Books.*

Reeve, Angela. "The Friendship Garden." *Healing Gardens in Children's Hospitals: Reflections on Benefits, Preferences and Design from Visitors' Books.*

Reeve, Angela. "The Garden of Dreams." *Healing Gardens in Children's Hospitals: Reflections on Benefits, Preferences and Design from Visitors' Books.*

Quecedo, Cecilia. *The Functionalist Awakening of Alvar Aalto in the Kinkomaa Tuberculosis Sanatorium. Each Thing in Its Place and a Distinctive Aesthetic for Each*

One. www.bing.com/cr?IG=C8487E862B4743F28DDB08205527BADD&CID=21F1B847AAB76EB81F9EB3AAAB186F56&rd=1&h=9nMHBH2xU91zCEf96mF163vvk5LGsyyfsSfMqc_b1C8&v=1&r=https%3a%2f%2fwww.alvaraalto.fi%2fcontent%2fuploads%2f2017%2f12%2fAAM_RN_Quecedo.pdf&p=DevEx.LB.1,5388.1.

Ray, Nicholas. Yale University Press, 2005, www.worldcat.org/title/alvar-aalto/oclc/60245466.

Scruton, Roger. "Perictione in Colophone." St Augstine's Press, South Bend, 2000.

Sherman, Sandra, et al. "Post-Occupancy Evaluation of Healing Gardens in a Pediatric Cancer Center." *Egyptian Journal of Medical Human Genetics*, Elsevier, 5 Jan. 2005, www.sciencedirect.com/science/article/pii/S0169204604001720.

Snape, Dianna. "Adventure Garden." *New Lady Cilento Children's Hospital / Lyons + Conrad Gargett*

Tennessen, Carolyn M., and Bernadine Cimprich. "Views to Nature: Effects on Attention." *Journal of Environmental Psychology*, vol. 15, no. 1, 1995, pp. 77–85., doi:10.1016/0272-4944(95)90016-0.

Tirilä, Soile. "Paimio Sanatorium Building." *Paimio Sanatorium*, www.paimiosanatorium.fi/.

Tirilä, Soile. "Paimio Sanatorium Lamp." *Paimio Sanatorium*, www.paimiosanatorium.fi/.

Tirilä, Soile. "Paimio Sanatorium Patient Room." *Paimio Sanatorium*, www.paimiosanatorium.fi/.

Tirilä, Soile. "Paimio Sanatorium Patient Wing." *Paimio Sanatorium*, www.paimiosanatorium.fi/.

ValentyneDreams. “The Garden ~ R.S. Thomas.” *A Fleur De Peau*, 10 Oct. 2015, afleurdepeu.wordpress.com/2015/10/14/the-garden-r-s-thomas/.

Weil, Simone, and George Andrew. Panichas. The Simone Weil Reader. Moyer Bell, 1999.

Welin, Gustaf. “Skittles in Garden” *Paimio Sanatorium Conservation Management Plan*.

Welin, Gustaf. “Sun Deck and Walkways.” *Paimio Sanatorium Conservation Management Plan*.

Welin, Gustaf. “Sun Deck and Woman.” *Paimio Sanatorium Conservation Management Plan*.

Woolf, Virginia. A Haunted House: and Other Short Stories. London: Hogwarth, 1962.

Zevi, Bruno. Towards an Organic Architecture. Faber Faber, 1982.

Zurko, Edward Robert De. *Origins of Functionalist Theory*. Columbia Univ. Press, 1967.

Biography

Aaron C. Quintanilla was born in El Paso, Texas on January 3, 1996. He enrolled in the Plan II Honors Program and McCombs School of Business to study Management Information Systems in 2014. In college, he interned for two summers at Ernst & Young in Austin, TX and Berlin, Germany. Outside of class, he spent his time playing tennis, writing and performing music, and attending concerts. He graduated in 2019 and will begin working in the Advisory department at Ernst & Young in Dallas, TX this summer.